

CLAIMS

We claim:

1. A method for cleaning containers containing a chemical comprising the steps of:

5 providing a container having a quantity of a chemical therein wherein the container has a plurality of valves for attaching a plurality of pipes thereto wherein the chemical is selected from the group consisting of chlorine gas and sulfur dioxide gas;

providing an input gas for injecting into the container;

10 providing a tank having a neutralizing material contained therein connected to the container;

injecting the container with the input gas to form an input gas/chemical mixture;

removing the input gas/chemical mixture from the container; and

15 injecting the input gas/chemical mixture into the tank for neutralizing the chemical.

2. The method of claim 1 wherein the container is a rail tank car.

3. The method of claim 1 further comprising the steps of:

providing a vacuum pump attached to the container; and

20 removing the chemical or the input gas/chemical mixture via the vacuum pump.

4. The method of claim 1 wherein the input gas is nitrogen gas.

5. The method of claim 1 further comprising the steps of:

providing an input gas tank attached to the container; and

heating the input gas prior to injection into the container.

25 6. The method of claim 1 further comprising:

injecting the input gas into the container and removing the input gas/chemical mixture a plurality of times until the chemical within the container reaches a predetermined level.

7. The method of claim 1 wherein the input gas is air.

30 8. The method of claim 7 wherein the air is dried via a dehumidifier.

9. The method of claim 1 further comprising the steps of:
attaching an input pipe to the container via a first valve; and
feeding the input gas into the container via the input pipe.
10. The method of claim 1 further comprising the step of:
5 inspecting the container prior to removing the chemical contained therein.
11. The method of claim 1 further comprising the step of:
searching the container for leaks prior to removing the chemical contained
therein.
12. The method of claim 1 further comprising the step of:
10 gauging the pressure within the container prior to removing the chemical
contained therein.
13. The method of claim 12 further comprising the step of:
injecting a quantity of input gas into the container if the pressure within the
container is about 0 psi prior to removing the chemical contained therein.
14. The method of claim 1 wherein the tank neutralizes both chlorine gas and
15 sulfur dioxide gas.
15. The method of claim 1 wherein the tank contains a neutralizing material
selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium
carbonate, calcium hydroxide, sodium sulfite, sodium thiosulfite, ferrous chloride and
20 solid bed absorbents.
16. The method of claim 1 further comprising the step of:
providing a control panel for controlling the injection of the input gas and
removal of the chemical or the input gas/chemical mixture from the container.
17. The method of claim 16 further comprising the step of:
25 synchronizing the injection of the input gas and removal of the chemical or the
input gas/chemical mixture from the container via the controller.
18. The method of claim 1 further comprising the steps of:
providing an input gas line attached to an input valve on the container;
providing an output line attached to an output valve on the container;

opening the input valve to allow the input gas to flow into the container while the output valve is closed;

closing the input valve; and

opening the output valve to remove the input gas and chemical mixture from the container.

19. The method of claim 18 further comprising the steps of:

providing a vacuum pump attached to the output line; and

activating the vacuum pump after the output valve is opened to remove the input gas and chemical mixture from the container.

20. The method of claim 1 wherein the chemical contained within the container is chlorine gas and further comprising the step of:

injecting the container with the input gas and removing the input gas/chemical mixture a plurality of times so the chlorine gas concentration within the container is about 0.5 ppm or below.

21. The method of claim 1 wherein the chemical contained within the container is sulfure dioxide gas and further comprising the step of:

injecting the container with the input gas and removing the input gas/chemical mixture a plurality of times so the sulfur dioxide concentration within the container is about 2.0 ppm or below.

22. The method of claim 1 further comprising the step of:

heating the input gas prior to injecting the input gas into the container.

23. The method of claim 22 further comprising the step of:

heating the input gas to a temperature of between about 100°F and about 300°F.

24. The method of claim 22 further comprising the step of:

heating the input gas to a temperature of about 200°F.